

Overview of Fall Line Air Quality Issues Fall Line Air Quality Information Exchange

Jimmy Johnston

Georgia EPD – Air Protection Branch

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Topics

- PM2.5
 - Annual Standard
 - 24-Hour Standard
- Ozone
 - Current Standard
 - Proposed Standard
- Fall Line Cities Comparison

What is PM_{2.5}?

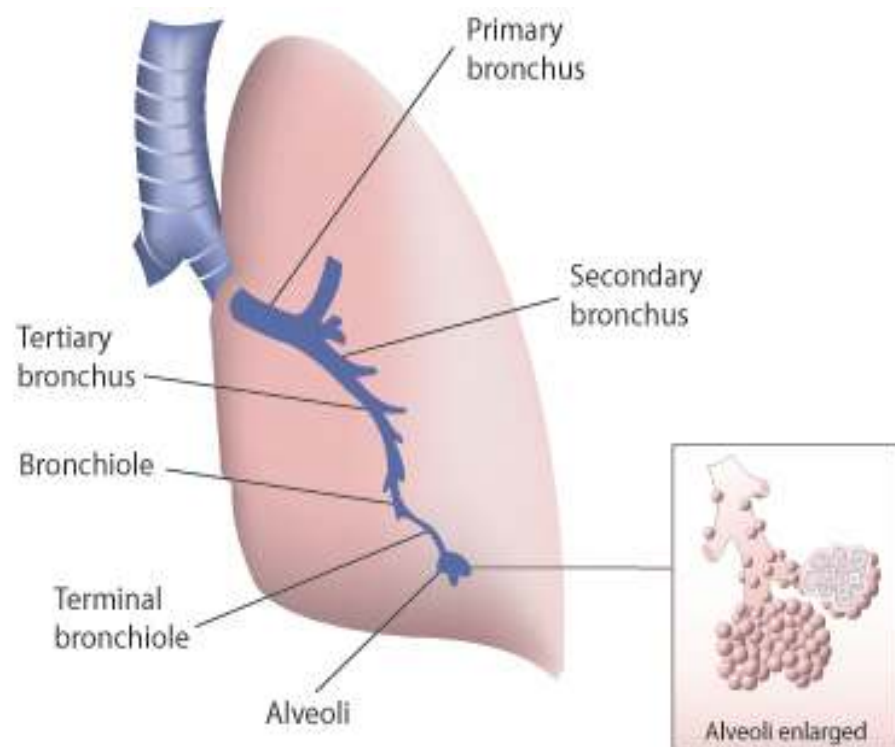
- Particulate Matter with aerodynamic diameter of less than 2.5µm
- A complex mixture of (extremely small) particles and liquid droplets
 - Ions (SO_4^{-2} , NO_3^- , NH_4^+)
 - Elemental and organic carbon (EC, OC)
 - Trace metals (e.g., Al, Ca, Fe, K, Se, Si, Ti, Zn)
- Can be emitted directly (Primary; e.g., EC) or formed from gaseous emissions (Secondary; e.g., $\text{SO}_2 \rightarrow \text{SO}_4^{-2}$)

How small is PM_{2.5}?



Image courtesy of the U.S. EPA

Particle pollution affects your lungs



Particle pollution can penetrate into the part of your lungs known as the alveoli, which deliver oxygen to the bloodstream.

You are exposed to particle pollution simply by breathing polluted air.

Exposure increases when you exercise, because you breathe more vigorously and deeply than usual.

People exposed to particles may experience a number of respiratory symptoms, including:

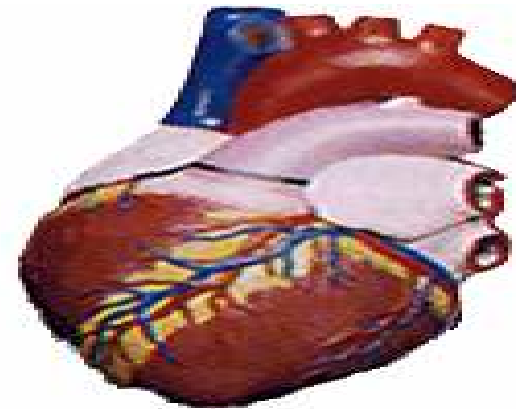
- **airway irritation;**
- **cough;**
- **phlegm;**
- **decreased lung function;**
- **airway inflammation;**
- **asthma attacks; and**
- **chronic bronchitis**

And particle pollution affects your heart

Particle pollution has been linked to changes that indicate your heart isn't as healthy as it should be. Those include:

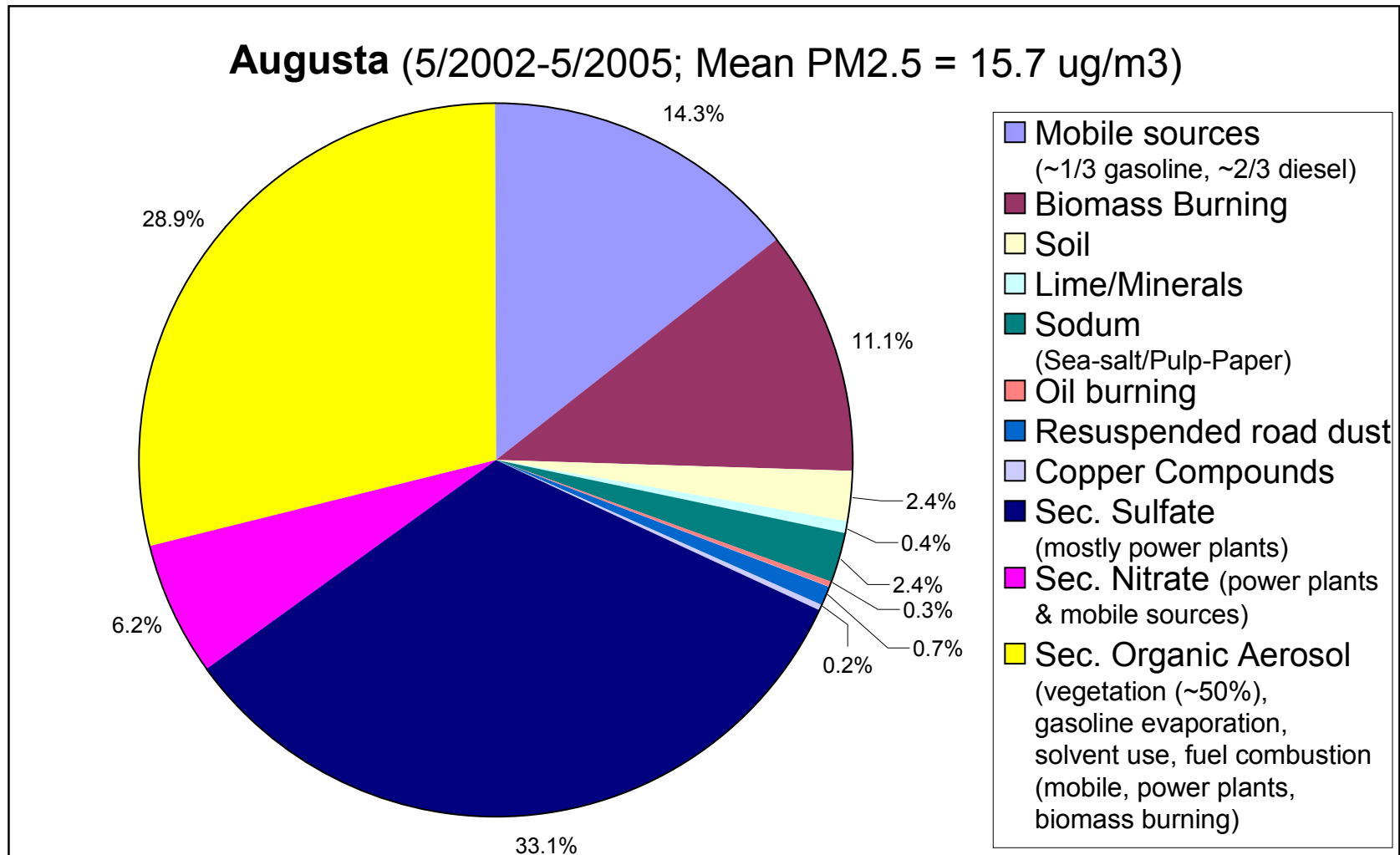
- **Arrhythmias** and **changes in heart rate**.
- **Changes in the variability of your heart rate**. Your heart rate should increase, for example, when you run and return to normal when you sit quietly. Decreased variability is a risk factor for heart attacks.
- **Blood component changes** that signal inflammation, and increased likelihood of potential blood clots, which can lead to heart attacks.

Some studies have shown that particle exposure causes **heart attacks**. And particles are linked with **death from heart disease**.

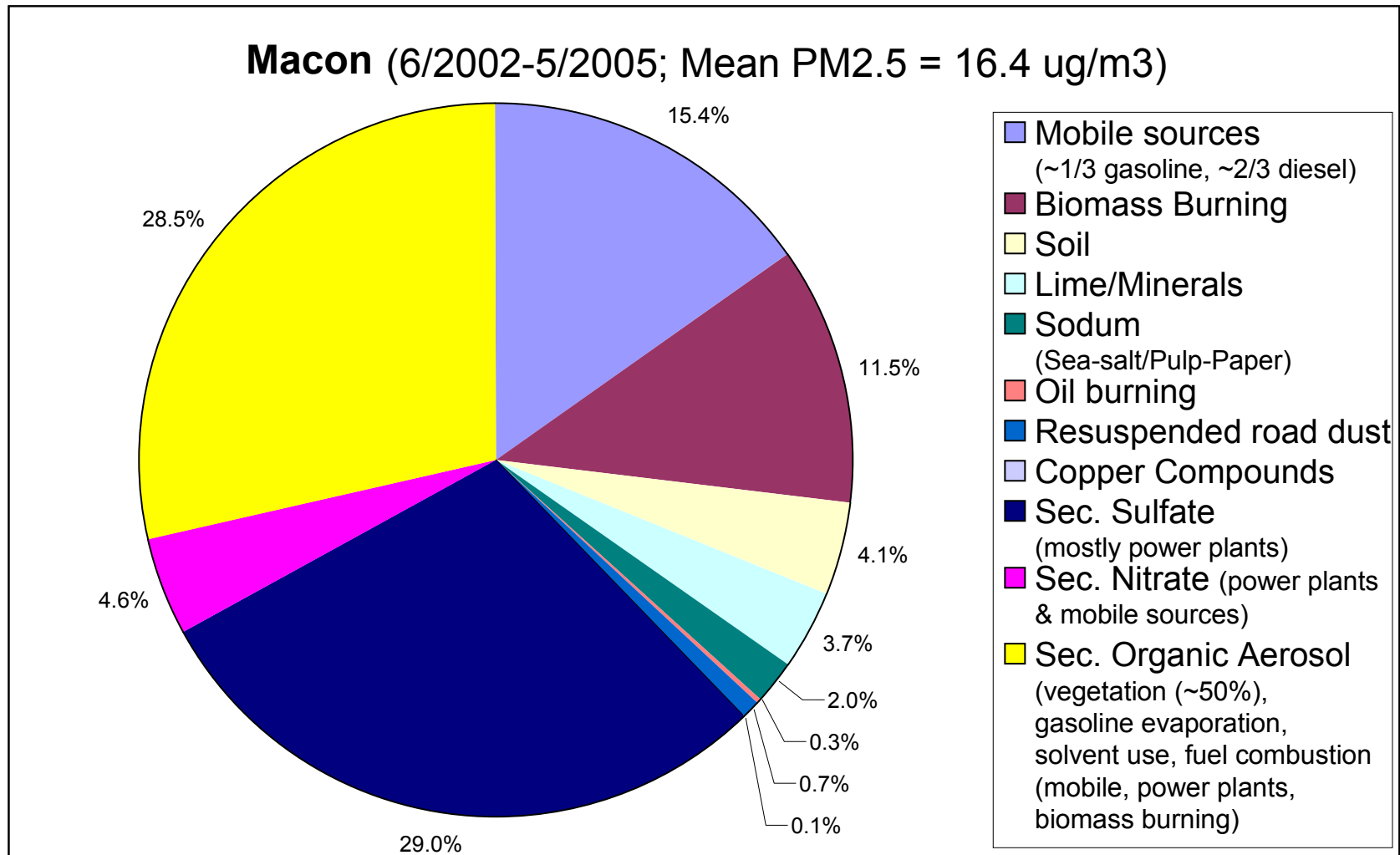


*Particle exposure
has been linked
to heart attacks.*

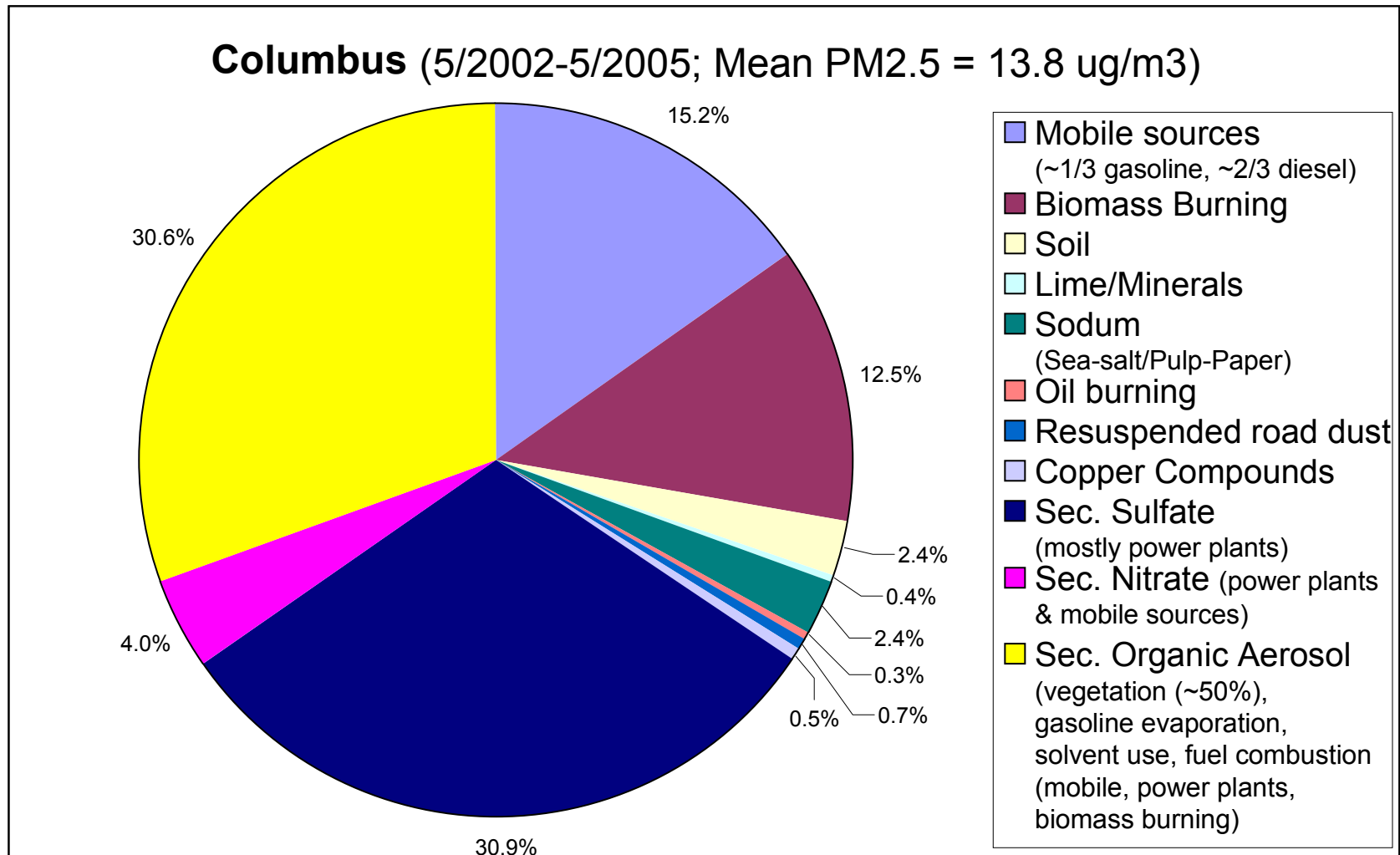
Average source-contributions: **Augusta**



Average source-contributions: **Macon**

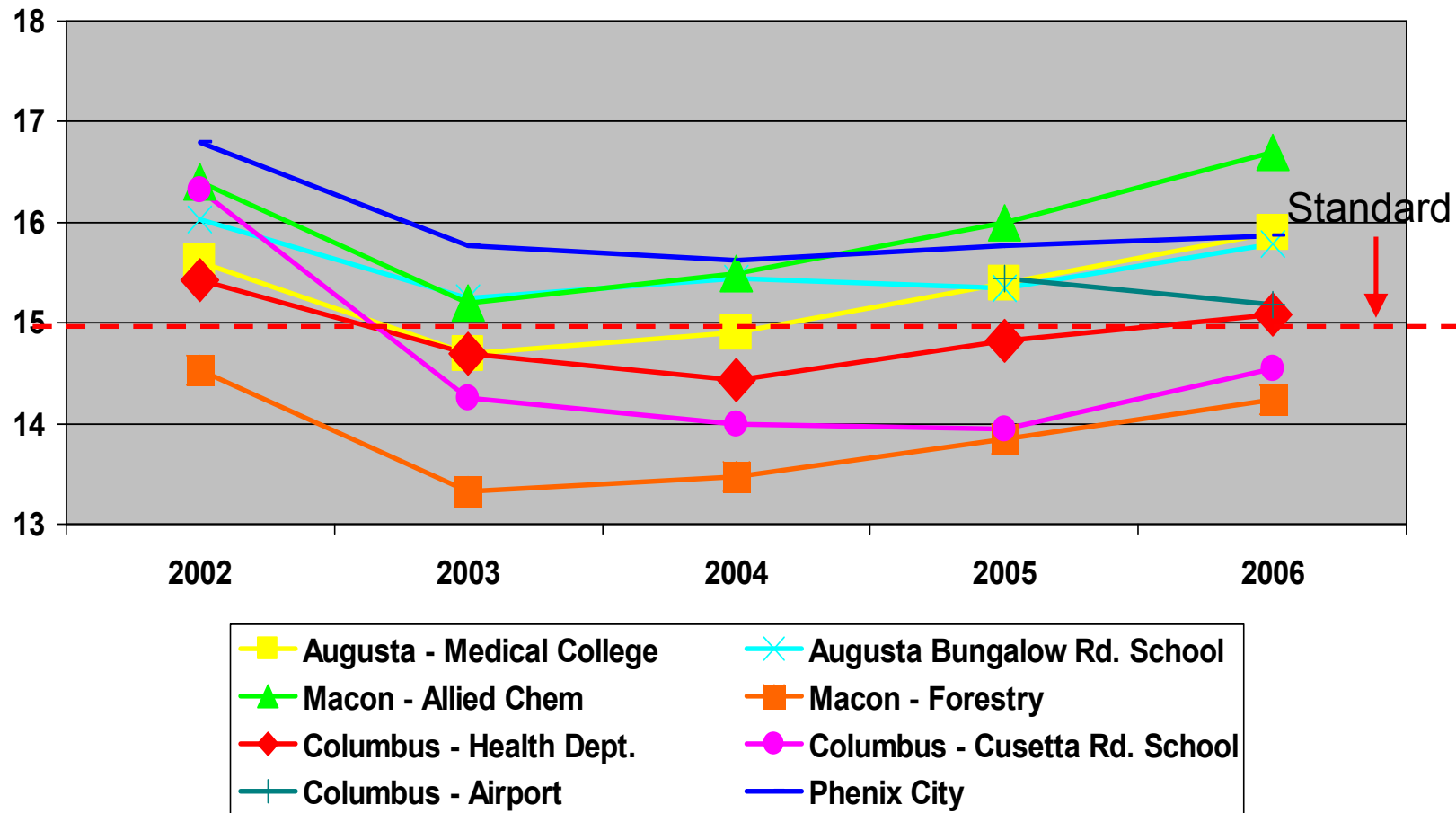


Average source-contributions: **Columbus**

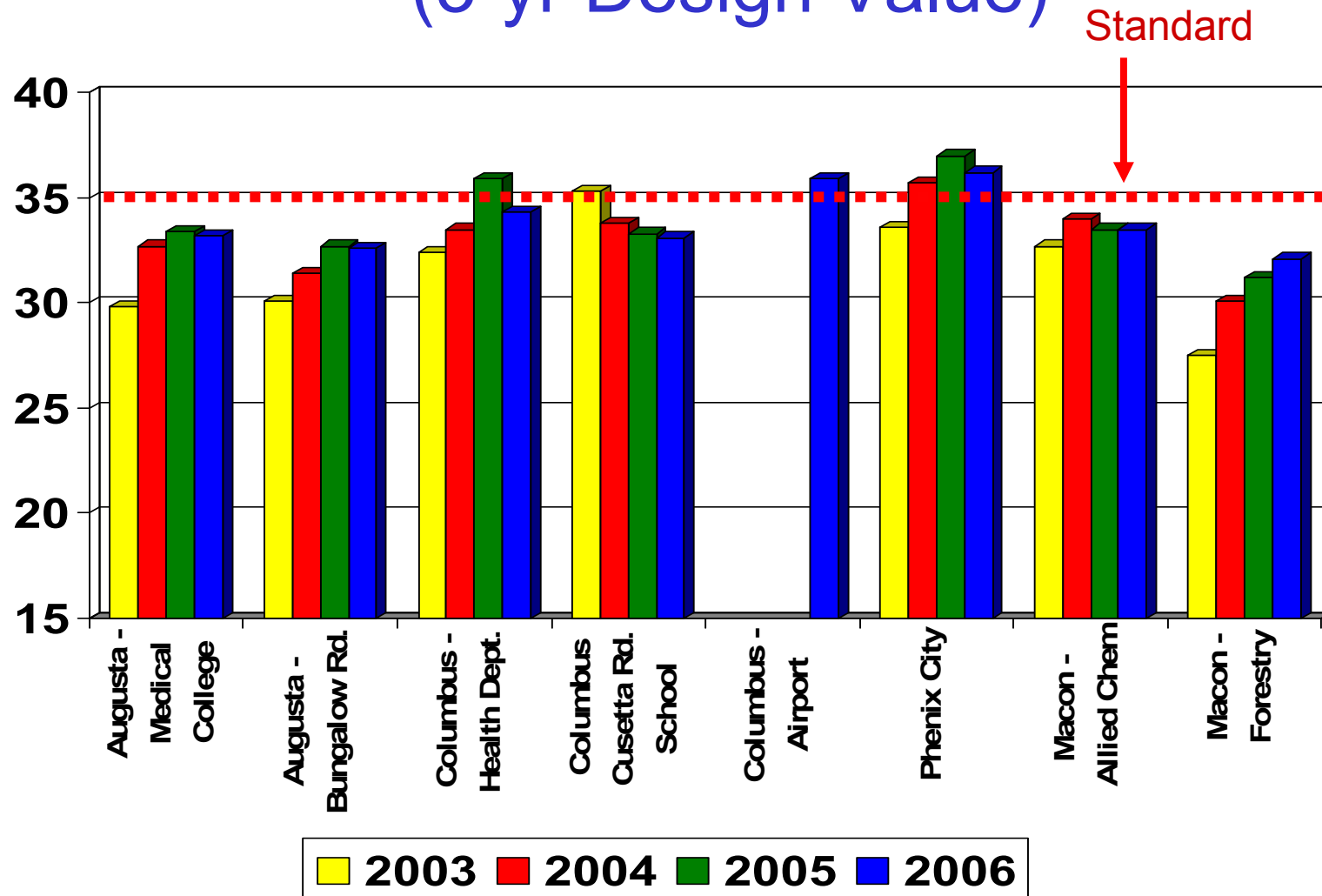


ANNUAL PM2.5 STANDARD

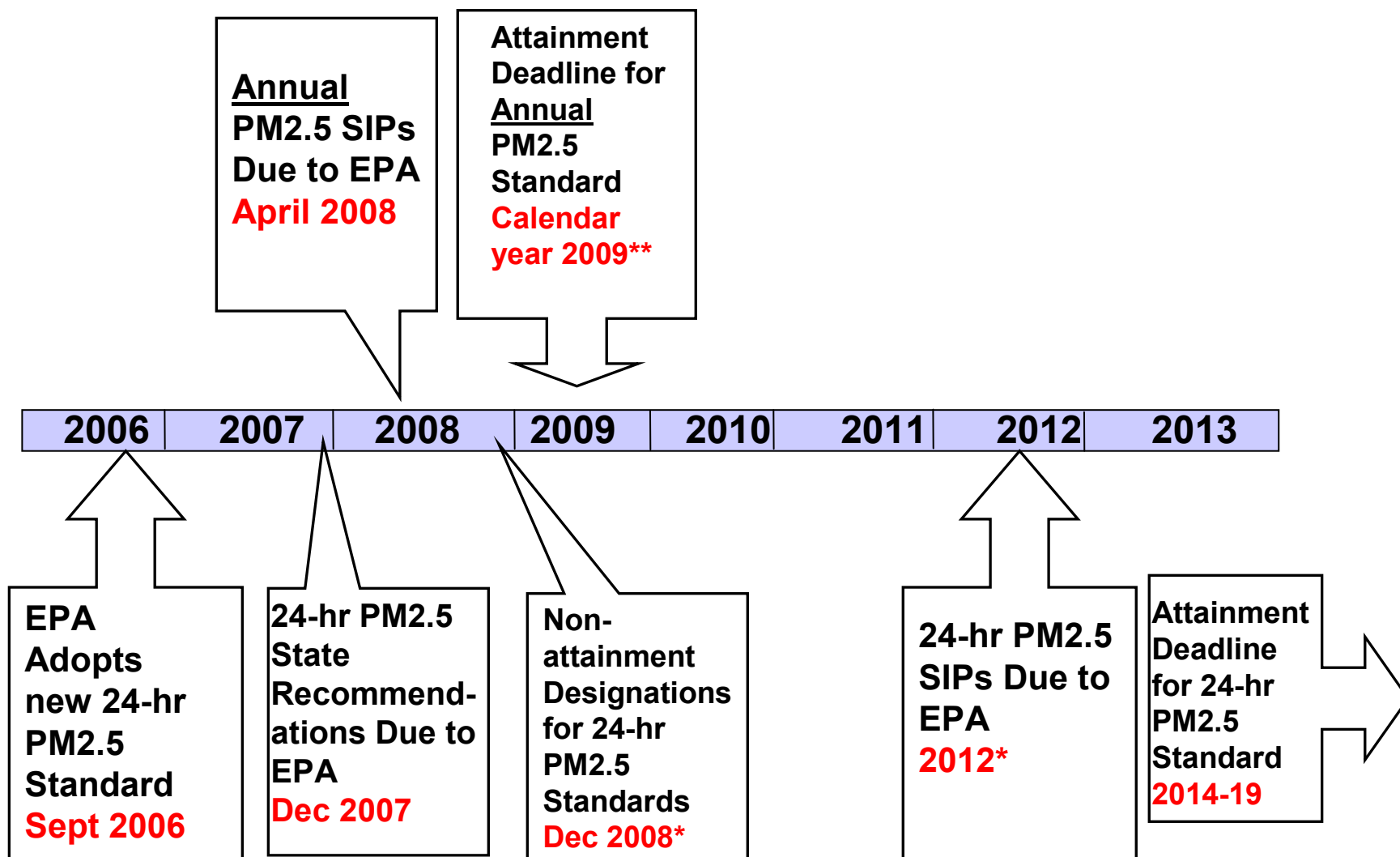
(3-year Average – microgram per cubic meter)



24-hour PM_{2.5} Standard (3-yr Design Value)



Air Quality Timeline –PM2.5



*Can be extended one year if additional information needed for designation

**Atlanta attainment deadline may be extended

Ozone (O_3)

- Major component of photochemical smog
- Secondary Pollutant
 - $NO_x + VOCs + \text{sunlight} \rightarrow \text{Ozone}$
 - Formed during the daytime
 - Chemistry is well known
- Highest concentrations in the Summer
 - High temperatures
 - Stagnant Winds

Ground-level Ozone Formation

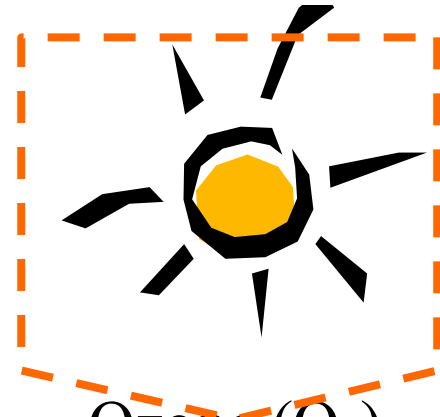
Volatile Organic
Compounds (VOCs)

+

Nitrogen
Oxides (NO_x)



Ozone (O₃)
Smog



Fuels, Paints,
Solvents, &
Vegetation



Combustion
Processes

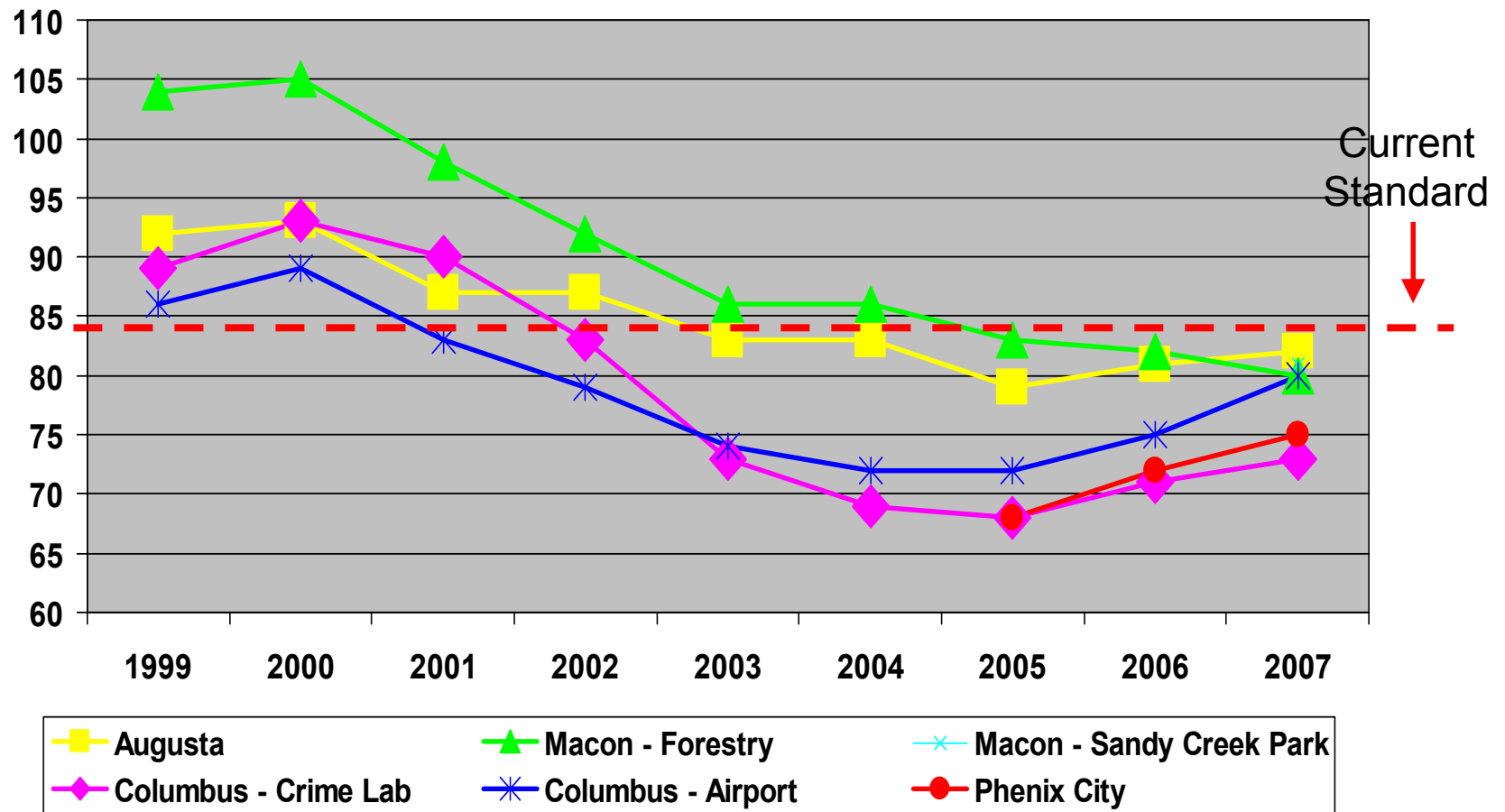


EFFECTS OF OZONE

- **Scars lungs & impairs lung function**
- **Causes respiratory diseases**
- **Aggravates heart disease & asthma**
- **Damages crops, trees & other vegetation**
- **Damages man-made substances such as synthetic rubber and textiles**

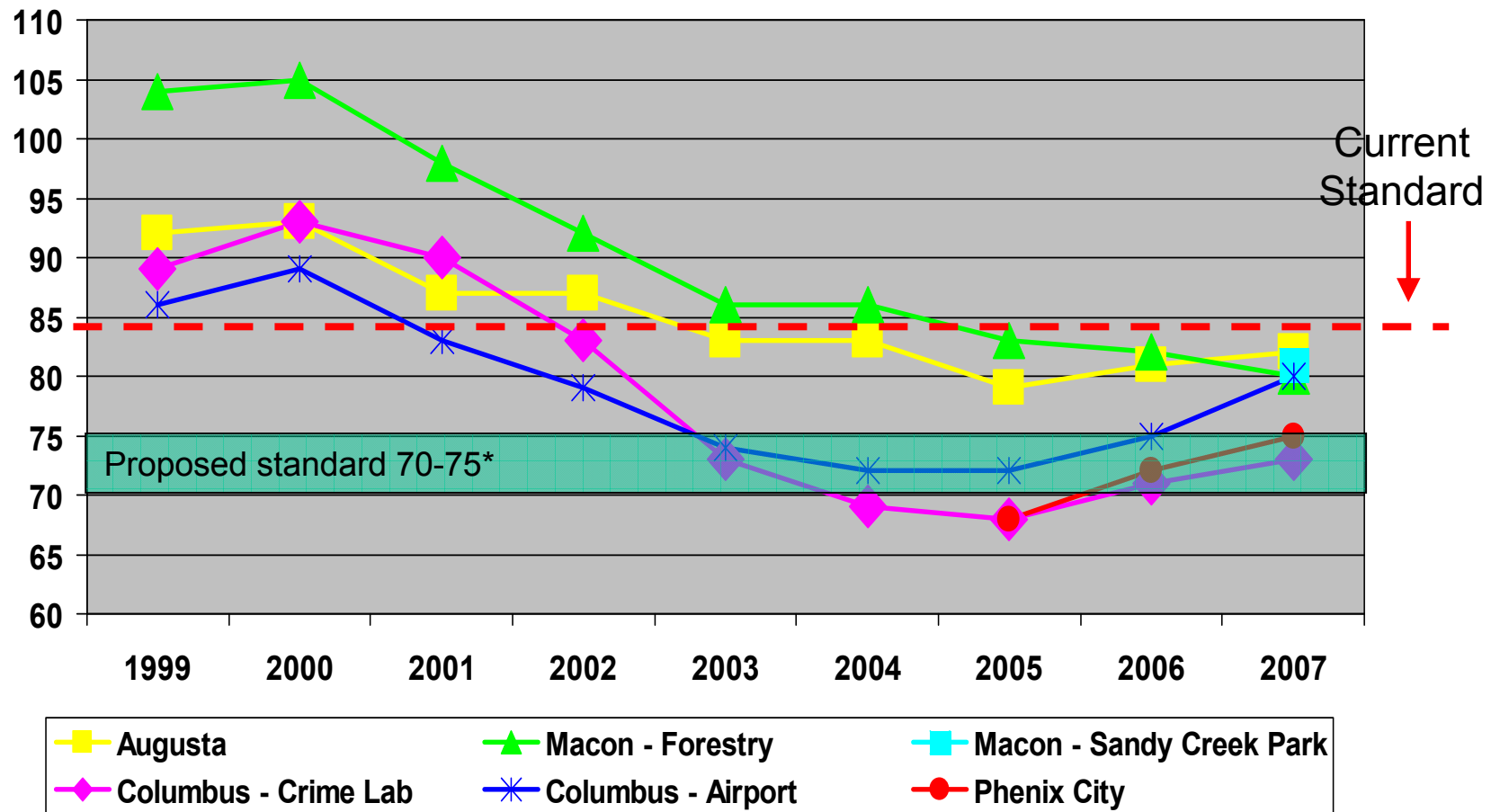
8-HR OZONE STANDARD

(3-year Average – part per billion)



8-HR OZONE STANDARD

(3-year Average – part per billion)



Georgia Environmental Protection Division

*EPA also taking comment on as low as 60 and as high as current standard

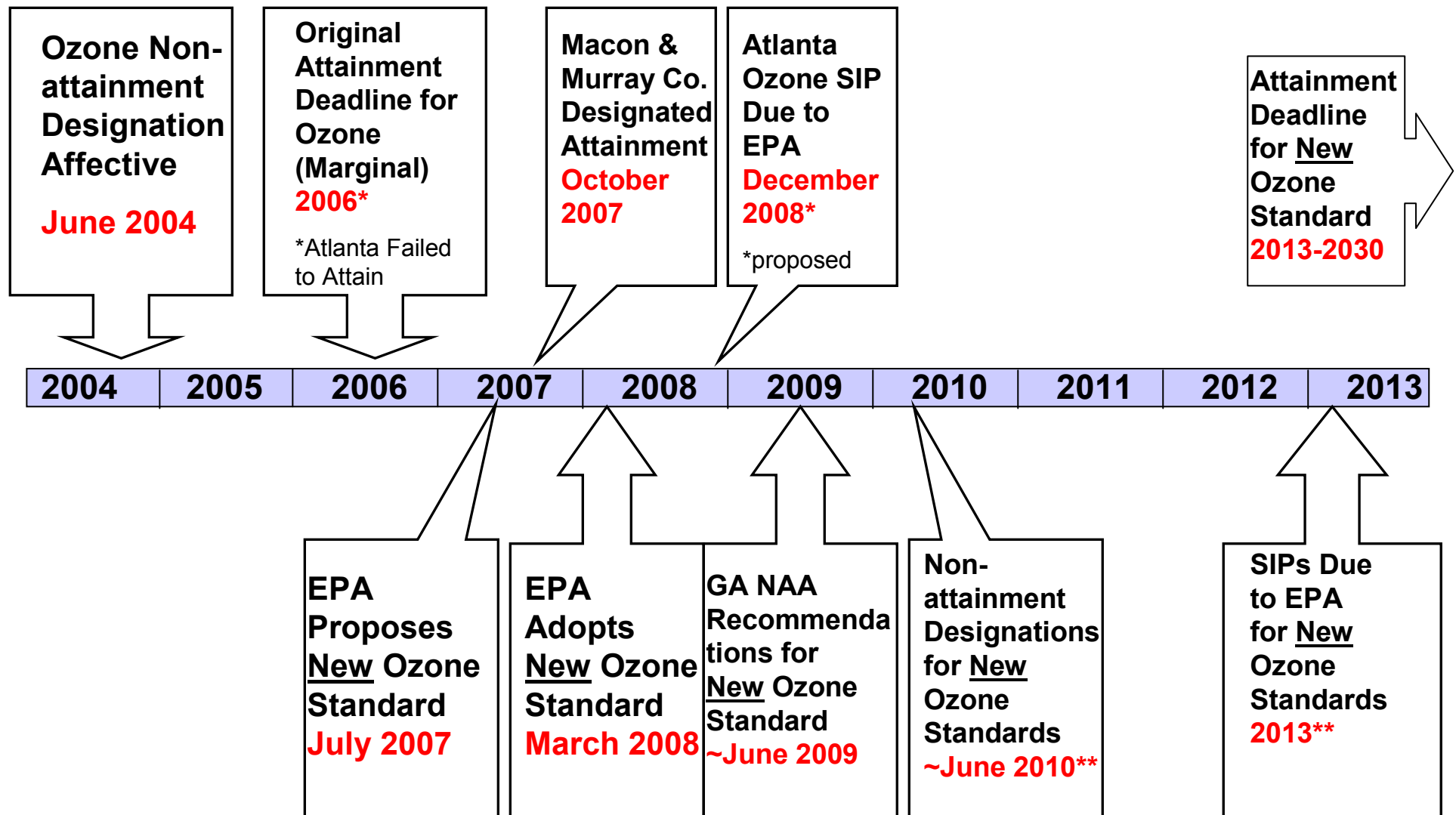
Proposed Revisions to Secondary Ozone Standard

- EPA is proposing two alternatives for the secondary ozone standard:
 - A new **cumulative, seasonal standard**, or
 - A standard identical to the proposed primary standard
- The proposed new seasonal standard is known as “W126”
 - W126 is a cumulative index form that weights and sums hourly measurements over a given period of time
 - EPA is proposing both a daily and seasonal time period over which to cumulate the weighted hourly measurements during the ozone season:
 - A 12-hour daily period
 - And a seasonal period consisting of the three months with the maximum W126 index value.
 - EPA is proposing to set this standard within a range of 7 to 21 ppm-hrs.
 - EPA is requesting comment on: whether the W126 standard should be calculated annually or averaged over three years



➤ **W126 value for Augusta, Columbus, & Macon between 7 –15 ppm-hrs**

Air Quality Timeline - Ozone



Georgia Environmental Protection Division

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Fall Line Cities Comparison

	Columbus	Macon	Augusta
Annual PM2.5 Attainment Status	Attainment	Nonattainment	Attainment
Plans Due	Voluntary – ASAP	SIP – 4/5/2007	Voluntary - ASAP
Control Measure Deadline	ASAP	1/1/2009	ASAP
Ozone Season Burn Ban	No	Yes	Yes
Air Quality Forecasting	PM2.5 Beginning 1/1/2008	Ozone and PM2.5	Ozone
24-HR PM2.5 Recommendation*	Nonattainment	Attainment	Attainment
Meeting Proposed Ozone Standard	No	No	No

Contact/Further Information

- Jimmy Johnston
 - (404)363-7014
 - jimmy_johnston@dnr.state.ga.us
- www.georgiaair.org